

# Researchers Watch Solar Eruption Sideswipe Bright Comet

A storm from the sun has struck a glancing blow on the tail of a passing comet, thrilling astronomers and solar physicists alike. The encounter with comet NEAT, captured by a solar satellite, should yield new insights about the twisted magnetic churnings of the sun's outbursts. "This is a fantastic laboratory for studying the interaction between the sun and a violently active comet," says planetary scientist Carey Lisse of the University of Maryland, College Park.

Formally known as C/2002 V1, comet NEAT was spotted in November by NASA's Near Earth Asteroid Tracking (NEAT) system in Hawaii. It grew bright enough in early February for viewers in the Northern

hemisphere and its steady solar wind of charged particles. When the comet's value became clear, LASCO operator Kevin Schenk fought through knee-deep snow to reach the closed operations center at NASA's Goddard Space Flight Center in Greenbelt, Maryland, to send special instructions to the satellite. Notably, shorter exposure times revealed features otherwise lost in the comet's glare.

SOHO's photos show the solar wind bombarding NEAT in unprecedented detail, says LASCO operations scientist Gareth Lawrence. In particular, the sun unleashed two giant eruptions of gas and tangled magnetic fields, called coronal mass ejections,

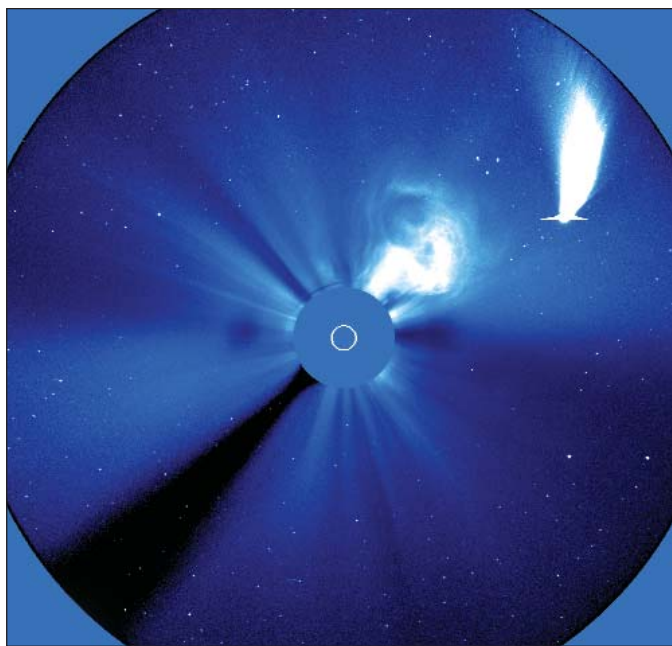
near the comet as it whipped past at 100 kilometers per second.

Researchers studying the images concluded last week that the edges of one ejection scrambled the ionized plasma tail, an event never before seen. "The tail seemed to split and form a wishbone," says solar physicist Jeff Morrill of the Naval Research Laboratory in Washington, D.C. One part of the ion tail stayed with the moving head of the comet while the rest rippled along the margins of the dust tail, as if a magnetic structure within the solar ejection held it in place, Morrill says. The same

eruption may have swept part of the dust tail into space, something else astronomers had not previously imaged.

The comet's vigorous display also promises to expose much about its own history, says Lisse. The wide dust tail reveals that flecks of many different sizes boiled off NEAT's nucleus, because larger particles are less affected by the solar wind's drag. "It's a fantastically structured and highly spread out tail, the best I've seen since comet West in 1975," Lisse says. As the comet recedes on its 37,000-year orbit, Lisse and his colleagues hope those grain sizes will help them reconstruct the conditions of NEAT's icy birth.

—ROBERT IRION



**Crashing gas.** This solar eruption apparently split comet NEAT's ion tail with a glancing blow. The bright fan is the dominant dust tail.

Hemisphere to see it after sunset with binoculars. On 18 February, the comet dove within 14.8 million kilometers of the sun, about 1/4 the distance of Mercury's orbit. That put NEAT within viewing range of a camera aboard the Solar and Heliospheric Observatory (SOHO), a joint NASA-European Space Agency satellite launched in 1995.

As its icy surface roasted at about 1000 kelvin, the comet disgorged a surprisingly broad dust tail and a fainter tail of ionized gas. NEAT became the brightest of more than 600 comets seen by SOHO's Large Angle and Spectrometric Coronagraph (LASCO) instrument, which blocks the sun's light to expose its blazing outer at-

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## ScienceScope

### Hughes Institute to End Graduate Fellowships

A depressed stock market and the desire to redirect its support for graduate training have led the Howard Hughes Medical Institute (HHMI) to cancel its 15-year-old graduate fellowship program. The program, which has funneled nearly \$150 million to support some 1200 doctoral students in the biological sciences, will end this spring after a final round of awards, but institute officials are already mulling options for replacing it.

"As impressive as these students are, I think that they would be funded whether we were there or not," says Peter Bruns, vice president for grants and special programs, about the fellowships. Half of the awards typically went to students attending Harvard, Stanford, and the Berkeley and San Francisco campuses of the University of California, he notes. "Our next step is to figure out what type of programs we want to support and to what end."

One possibility is institution-based traineeships that would allow Hughes to focus attention on, for example, interdisciplinary collaborations or applications of research to patient care. Terminating the program will save \$17 million a year, says Bruns, helping HHMI cope with a 3-year economic downturn that has shrunk its endowment from \$13 billion to \$10.1 billion.

—JEFFREY MERVIS

### More Greenbacks for U.S. Farm Research

Agricultural researchers are cheering a major funding boost for a flagship program. Congress last month gave a 40% boost to the U.S. Department of Agriculture's (USDA's) National Research Initiative (NRI). NRI is USDA's main competitive grants program, funding everything from genome sequencing to environmental studies.

Although the record \$47 million increase, to \$166 million for this year, fell short of the White House's request for \$240 million, ag science advocates aren't complaining. Besides funding more proposals, the new cash will help soften the blow delivered by "declining resources from traditional sponsors and state support," says Karl Glasener, science policy chief for the agronomy, crop science, and soil science societies in Washington, D.C.

Science lobbyists are hoping to repeat the success in the 2004 budget, which recently began working its way through Congress. The Bush Administration has requested \$200 million for NRI, but it could be difficult to win that 20% jump if there's a war and the economy continues to stagger.

—DAVID MALAKOFF